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(54) Method and apparatus for reducing cross talk using line coding

(57) To accommodate the overlay of broadband information over narrowband signals while reducing cross-talk in upstream and downstream directions, different baseband line codes are used to modulate respective upstream and downstream transmissions on a common wireline communication resource, such as a twisted copper-pair. In this way, filtering components located at each end of a connection can reject cross-talk that arise between wanted broadband signals having a first baseband line code and spectrally-shifted cross-talk emanating from interfering broadband signals having a different baseband line code.

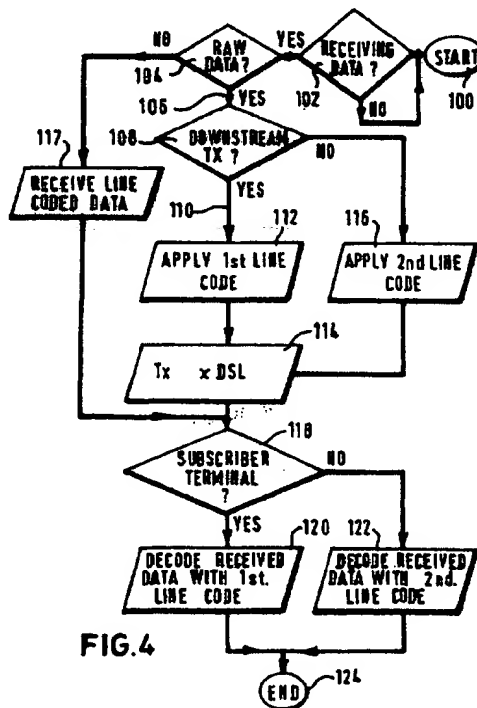


FIG.4

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EUROPEAN SEARCH REPORT

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EP 98 30 9092

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|--|---|---|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
| X | US 5 680 394 A (TONG PO ET AL) 21 October 1997 (1997-10-21) * abstract; claims 1,5,6,11-13,20; figure 6 * * column 1, line 39 - line 61 * * column 2, line 9 - line 26 * * column 3, line 8 - line 21 * * column 3, line 28 - line 35 * * column 5, line 24 - line 44 * * column 7, line 43 - line 67 * * column 8, line 48 - column 9, line 11 * --- | 1-30 | H04L5/02 |
| X | US 5 515 378 A (OTTERSTEN BJORN ET AL) 7 May 1996 (1996-05-07) * column 1, line 18 - line 47 * * column 7, line 27 - line 32 * * column 9, line 15 - line 31 * * column 9, line 43 - column 10, line 10 * * column 24, line 62 - column 25, line 7; claims 3,4,7 * --- | 1-30 | |
| X | WO 97 06619 A (TELIA AB ;ISAKSSON MIKAEL (SE)) 20 February 1997 (1997-02-20) * abstract; claims 1,2,4,7 * * page 1, line 10 - line 19 * * page 2, line 28 - line 38 * * page 3, line 25 - line 32 * * page 4, line 27 - line 30 * * page 6, line 2 - line 11 * * page 6, line 31 - page 7, line 7 * --- -/-- | 1-30 | TECHNICAL FIELDS SEARCHED (Int.Cl.6) H04L |
| The present search report has been drawn up for all claims | | | |
| Place of search BERLIN | | Date of completion of the search 15 August 2001 | Examiner Binger, B |
| CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | | | |

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Application Number
EP 98 30 9092

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|--|---|--|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
| X | GB 2 311 196 A (NORTHERN TELECOM LTD) 17 September 1997 (1997-09-17) * abstract; claims 1-3,5,7; figure 3 * * page 1, line 11 - page 2, line 9 * * page 3, line 20 - page 4, line 16 * * page 5, line 31 - page 6, line 11 * * page 7, line 17 - line 33 * * page 9, line 1 - line 10 * ----- | 1-30 | |
| | | | TECHNICAL FIELDS SEARCHED (Int.Cl.6) |
| The present search report has been drawn up for all claims | | | |
| Place of search BERLIN | | Date of completion of the search 15 August 2001 | Examiner Binger, B |
| CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | | | |

EPO FORM 1503 (3-92) (P04C01)

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15-08-2001

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| US 5680394 A | 21-10-1997 | AU 720576 B | 08-06-2000 |
| | | AU 6478296 A | 10-02-1997 |
| | | CN 1190511 A | 12-08-1998 |
| | | EP 0838109 A | 29-04-1998 |
| | | JP 11509062 T | 03-08-1999 |
| | | WO 9703506 A | 30-01-1997 |
| | | US 5838667 A | 17-11-1998 |
| US 5515378 A | 07-05-1996 | AT 183865 T | 15-09-1999 |
| | | AU 670766 B | 01-08-1996 |
| | | AU 3145493 A | 19-07-1993 |
| | | CA 2125571 A | 24-06-1993 |
| | | DE 69229876 D | 30-09-1999 |
| | | DE 69229876 T | 30-12-1999 |
| | | EP 0616742 A | 28-09-1994 |
| | | EP 0926916 A | 30-06-1999 |
| | | ES 2137197 T | 16-12-1999 |
| | | FI 942771 A | 10-06-1994 |
| | | JP 7505017 T | 01-06-1995 |
| | | WO 9312590 A | 24-06-1993 |
| | | WO 9818272 A | 30-04-1998 |
| | | US 5546090 A | 13-08-1996 |
| | | US 5625880 A | 29-04-1997 |
| | | US 5592490 A | 07-01-1997 |
| | | US 5642353 A | 24-06-1997 |
| | | US 5828658 A | 27-10-1998 |
| WO 9706619 A | 20-02-1997 | EP 0883944 A | 16-12-1998 |
| | | SE 9502775 A | 05-02-1997 |
| GB 2311196 A | 17-09-1997 | EP 0886926 A | 30-12-1998 |
| | | WO 9735399 A | 25-09-1997 |
| | | JP 2000512443 T | 19-09-2000 |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82